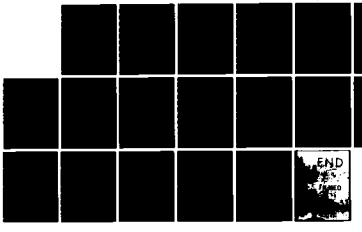
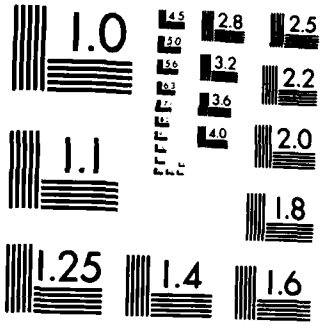
AD-A145 796 COMPUTER CENTER INTRODUCTORY REFERENCE MANUAL FOR CDC CYBER(U) DAVID W TAYLOR NAVAL SHIP RESEARCH AND DEVELOPMENT CENTER BET.. D V SOMMER MAY 84 1/1

UNCLASSIFIED DTNSRDC/CMLD-84-09 F/G 9/2 NL





COMPUTER CENTER INTRODUCTORY REFERENCE MANUAL FOR CDC CYBER

CMLD-84-09

DAVID W. TAYLOR NAVAL SHIP RESEARCH AND DEVELOPMENT CENTER

Bethesda, Maryland 20084

COMPUTER CENTER INTRODUCTORY REFERENCE MANUAL FOR CDC CYBER

by

David V. Sommer

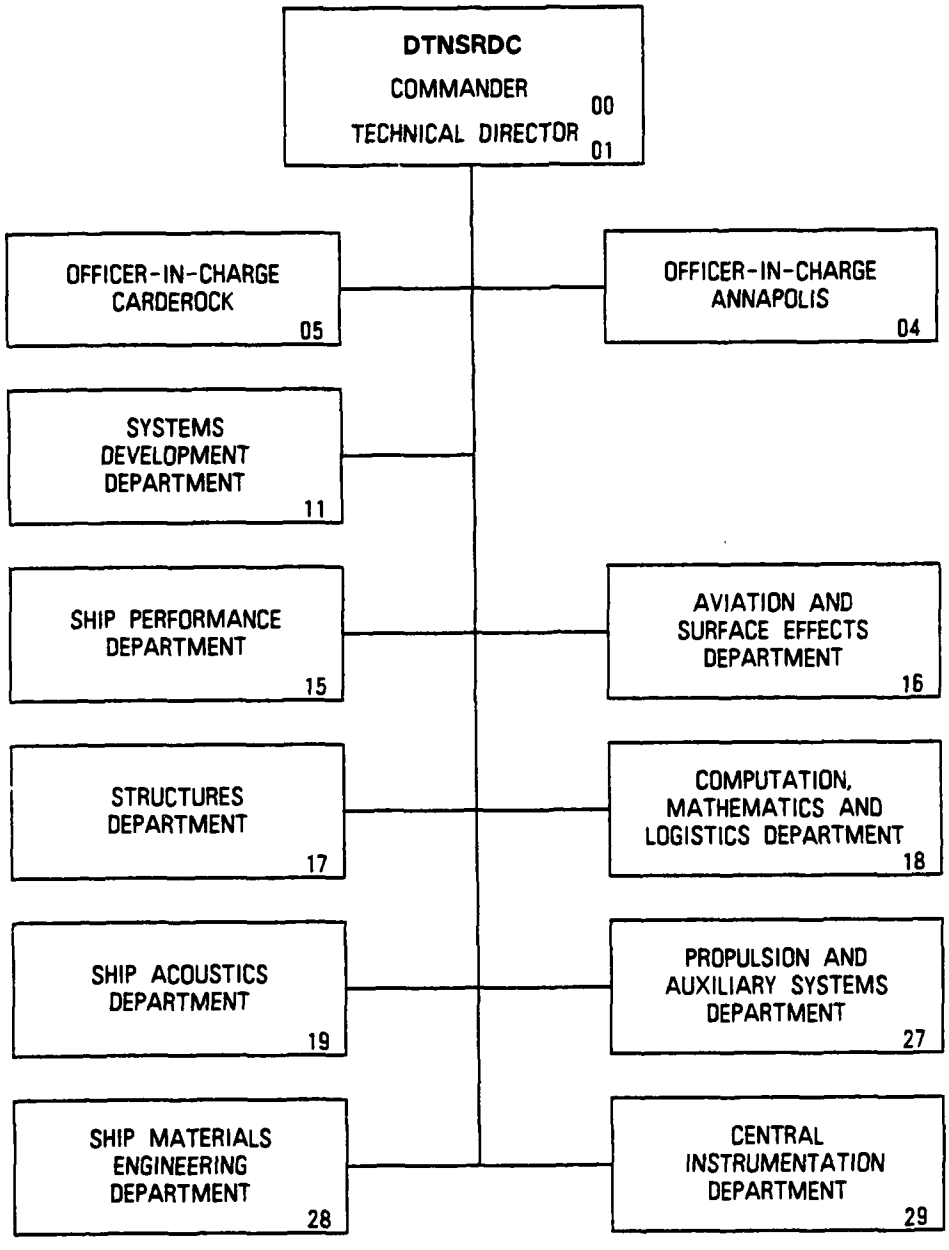
Computation, Mathematics and Logistics Department
Departmental Report

May 1964

CMLD-84-09

NDW-DTNSRDC 5602/30 (2-80)
(supersedes 3960/46)

MAJOR DTNSRDC ORGANIZATIONAL COMPONENTS



SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER CMLD-84-09	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) Computer Center Introductory Reference Manual for CDC CYBER 170		5. TYPE OF REPORT & PERIOD COVERED FINAL 6.PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) David V. Sommer		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS DTNSRDC, User Services, Code 1892 Bethesda, Maryland 20084		10. PROGRAM ELEMENT,PROJECT,TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS Computation, Mathematics & Logistics Dept. Computer Facilities Division (189)		12. REPORT DATE May 1984 13. NUMBER OF PAGES 29
14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office)		15. SECURITY CLASS.(of this report) Unclassified 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Approved for Public Release; Distribution Unlimited

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20,if different from Report)

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

CDC CYBER
Control Card
NOS/BE Operating System
Software

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The Computer Center Introductory Reference Manual provides an introduction to the CDC CYBER NOS/BE Operating System for new users. Some information has been distilled from many individual documents and reflects usage at DTNSRDC. Control card examples and descriptions of some software are included.

DD FORM 1 JAN 73 1473 EDITION OF NOV 1 65 IS OBSOLETE
S/N 0102-LF-014-6601

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

****

David W. Taylor
Naval Ship Research and Development Center
Bethesda, Maryland 20084

Computer Center Introductory Reference Manual for CDC CYBER

****

by
David V Sommer
User Services Branch

Code 1892

	Carderock	Annapolis
Phone	(202) 227-1907	(301) 267-3343
Autovon	287-1907	281-3343

A1

Computation, Mathematics and Logistics Department
Departmental Report

May 1984

CMLD-84-09

Table of Contents Page

*** Glossary ***

The following terms are mentioned in this report:

Access number
Each account number (job order number) is assigned an access number which is used on the batch CHARGE card (see 2-3) and Intercom LOGIN (see 3-1).

Alphameric A letter (A-Z) or a digit (0-9). Also called alphanumeric.

Catalogued procedure
A previously-defined sequence of control statements for performing a task. A catalogued procedure is executed using the BEGIN control statement.

CLIB "Computer Center CDC Libraries", CMLD-84-11. (see 2-9: example 8)

CCRM "Computer Center CDC Reference Manual", CMLD-84-10.

CDC CYBER Refers to either or both of the CDC computers at DTNSRDC: CYBER 176, CYBER 750. These computers are also referred to by their mainframe letters: MFE (CYBER 750), MFF (CYBER 176).

Control card record
Control statement record
The first group of statements/cards in a batch job, ending with a card having 7/8/9 multi-punched in column 1 (if a card deck) or an end-of-record (if created interactively). These are all the control statements to be processed during the job. Any additional records, such as a source program or data, follow the control statement record.

Dayfile, batch
As a batch job is being run, a permanent record of the job activity is created. This is called the dayfile, a copy of which is printed at the end of each batch job. The dayfile includes a list of all control statements executed, any system- or program-generated messages and a summary of the system usage including the estimated basic charge. This charge does not include card reading/punching or line printing. (See POLICY for the current rates.) Each message has the time-of-day it was written.

Dayfile, Intercom
: As commands are executed during an Intercom session, messages are generated similar to those in batch. They are collected and printed at the terminal, usually at the end of each command, though some may be printed during the execution of a command. Except for LOGOUT (see 3-1), the dayfile messages are not time-stamped.

<eor>, <eoi>
: Used in examples in this manual to represent an EOR (end-of-record) or EOI (end-of-information). In a card deck, <eor> is a multi-punched 7/8/9 in column 1; <eoi> is a multi-punched 6/7/8/9 in column 1.

Field length (FL)
: The amount of memory occupied by a program. Addresses in a program are relative to the start of the field length, called the reference address (RA). A program occupies from RA+0 thru RA+FL-1. Thus, a user never needs to know the actual location of the program in memory.

Logical record
: Information separated from other information in a file by end-of-record's. In a card deck, the 7/8/9 card is the end-of-record.

POLICY
: "Computer Center Policy" manual.

User initials
: (also called user-id or usercode). The 4-character ID assigned to each user by Code 189.3. This is used to identify jobs, for charge authorization, to identify permanent files, Mass Storage System files and magnetic tapes, etc.

***** INTRODUCTION *****

DTNSRDC has two CDC computer systems: a CYBER 176 (MFF) and a CYBER 750 (MFE). The operating system on each is the Network Operating System/Batch Environment, version 1 (NOS/BE 1). NOS/BE has two major subsystems

1) The batch system for processing jobs submitted at Central Site, through remote batch terminals or from interactive terminals;
2) The time-sharing system, called INTERCOM, which supports teletypes and other interactive terminals.

DTNSRDC has a third CDC computer, a CYBER 825, which supports the Mass Storage System (MSS). It uses the NOS operating system and its files may be accessed from the other CDC computers via special NOS/BE control statements.

This Introductory Reference Manual is designed to provide the new user with enough information to run simple batch jobs and to create and run programs and batch jobs interactively. Some of the most frequently used control statements are described. Magnetic tapes and user-owned device sets (disks) are not discussed. No attempt is made to describe all features of the operating system or even all parameters of the control statements presented. More information can be found in the companion publications "Computer Center CDC Reference Manual" (CCRM), "Computer Center CDC Libraries" (CLIB), "Computer Center Policy" (POLICY).

Before using the system, job order number(s) to be charged must be registered and an access number obtained from Code 189.3. Outside users must transfer funds to DTNSRDC before receiving a job order number. The access number is used only on the batch CHARGE card (see 2-3) and the Intercom LOGIN (see 3-1). At all other times the job order number is used. Each individual user should have 4-character user initials assigned (also by Code 189.3, telephone (202) 227-1910).

The CYBER 750 is used during classified time to process jobs for classified projects.

*** Files ***

The CDC CYBER is a file-oriented system. A file is a collection of related records treated as a unit. It may reside on disk, magnetic tape, cards, printer output. Files may be temporary or permanent. Temporary files exist for all or part of a job or Intercom session; permanent files are added to the system by the user and remain until removed by the user or until removed by the Computer Center for lack of use (see 2-3: AUDIT).

Permanent files are identified to the system by a permanent file name (pfn) having 1-40 alphameric characters (letters and/or digits) and an ID (the 4-character user initials), both supplied by the user. Some permanent files may be accessed by several jobs simultaneously.

There are two sets of permanent files: one is for the CYBER 176; the second is for the CYBER 750. Permanent files may be transferred among or shared by all CDC computers using the MSS. (See "Computer Center Mass Storage System User's Guide" (CMLD-82-19) and CCRM, Chapter 10.)

During a batch job or interactive session, all files, whether temporary or permanent, must have a unique means of identification. this is called the local file name (lfn) which begins with a letter and contains 1-7 alphameric characters. The lfn is defined in one of many ways:

1) ATTACHing a permanent file (in this case the lfn may be the same as the permanent file name (pfn)).
2) executing control statements (such as COPYE, FTN5, REQUEST, REWIND) which operate on files.
3) executing a user program.
4) saving a file in NETED or EDITOR (Intercom).

Once defined, the lfn remains until end-of-job or end-of-session unless released by commands such as RETURN, ROUTE, DISCARD (see 2-5, 3-2).

Several lfn's have special meaning in batch jobs. Some of these are:

INPUT - batch card deck
OUTPUT - printer output
PUNCH - coded punched card output (BCD)

Examples

The following illustrate both stated and implied local file names for some typical control statements:

command	local file names
COPYSF,INPUT,OUTPUT.	INPUT OUTPUT
FTN5.	INPUT OUTPUT LGO (see 2-4)
REQUEST,MYFILE,*PF.	MYFILE
ATTACH,MYPROG,PROGRAM,ID=xxxx.	MYPROG
ATTACH,UTILITY.	UTILITY (also pfn)
RETURN,A,B,C.	A B C

***** BATCH JOBS *****

A batch job consists of one or more records (which are called logical records and are separated by end-of-records (EOR)). The job is terminated by an end-of-information (EOI). If the batch job is a card deck, the EOR is a card with 7/8/9 multi-punched in column 1 and is represented by <eor> in the examples; the EOI is a (green) card with 6/7/8/9 multi-punched in column 1 and is represented by <eoi> in the examples.

The first record contains all the control statements for the job. Each statement invokes a program to perform the required task (e.g., 'REWIND,....' to rewind files; 'FTN5,....' to compile a FORTRAN program; 'LGO.' to execute a compiled program).

Any additional records contain data for the programs executed in the control statement record (e.g., source program for FTN5 compiler, data for a user program).

Some characters have different punches in 026 (BCD) and 029 (ASCII) mode. The most frequently used ones are '(', ')', '=', '+'. All cards in the logical record must be punched in the same mode (all 026 or all 029). A change of mode is indicated by '26' or '29' in columns 79-80 of the EOR card preceding the record. The mode of the control card record is indicated in columns 79-80 of the job card (omitted=026). Some medium-speed remote terminals (CDC 200-UT-compatible) require that all cards in a job be in one mode. See 2-8: Example 6.

At the end of this chapter are several examples illustrating some typical batch jobs.

*** Control Statement Record ***

The first card of each job is the job card; next is the CHARGE card. The remaining control statements depend upon the tasks to be performed.

A control statement contains a program name or command followed by zero or more parameters, separated by commas, and enclosed in parentheses (or comma..period):

```
PROG.
PROG(param1,param2,...,paramn)
PROG,param1,param2,...,paramn.
```

The control statement record ends with an EOR.

*** Job Output ***

Listable output is normally written onto file OUTPUT. When printed, it will consist of one or two banner pages containing the NOS/BE job name (see description of job card below). Next is one page with the system bulletin which gives important information to the user (it is updated frequently). Then follow the pages of user output: compilation listings, loader maps, user program output, etc. Last is the dayfile (see Glossary).

*** Job Card ***

The job card identifies the job and defines memory and time requirements and run priority. For additional parameters, see CCRM, 5-3.

Job card requirements vary among installations. At DTNSRDC, the following must be observed:

CYBER 176 -	orange	(Carderock)
	yellow stripe	(Annapolis)
CYBER 750 -	blue or purple	(Carderock)
	yellow stripe	(Annapolis)

No other cards in a deck may be of these colors.

The job card has the form:

```
jobname,CMnnnnnn,Pn,Tnnnn.                    code/name                kp
```

jobname — is the job name. It identifies the job. To insure uniqueness among jobs, NOS/BE will alter the 6th and 7th characters. This NOS/BE job name (jobna**) will appear on the banner page of the output. The job name has the form:
xxxxyyy, where
xxxx are the user initials (assigned by Code 189.3)
yyy may be any letters or digits or omitted.

CMnnnnnn — is the maximum (octal) memory the job will require, if greater than the default of 65000.
nnnnnn is an octal number <= 377700.

Pn — is the job priority. It may be one of the following:
P4 - express (small jobs; higher charge)
P3 - regular (default)
P2 - deferred (overnight if < 2 wall clock hours)
P1 - deferred (after 6 PM) same rate as P2
P0 - block time (will run only at pre-scheduled times)
emergency - by special written request only, see POLICY
Charges increase for greater priority (P2 has the lowest charge).
(See POLICY for additional CM, time, tape and user device set combinations for P3, P4.)

Tnnnn — is the time limit for the job in decimal seconds.
nnnn is a decimal number (default: 60 (MFF) or 120 (MFE))

code/name — are comments identifying the job owner.

kp — columns 79-80. If control cards are punched in 029 mode, enter '29'; if 026 mode, leave blank or enter '26'.

If only the jobname is specified, the default job card is:

```
jobname,CM65000,P3,T60.                                    26     <-- MFF
jobname,CM65000,P3,T120.                                   26     <-- MFE
```

Some user sites have different forms of the job name and code/name comments. Contact your local User Services group.

*** CHARGE Card ***

The second card must be a CHARGE card which has the following format:

CHARGE,xxxx,accessnmbr.

xxxx are your user initials

accessnmbr is the access number corresponding to the job order number for charging this job

*** Some NOS/BE Control Statements ***

The following are some of the most frequently used control statements (listed alphabetically). Where appropriate, there is a reference to similar or related statements. Additional parameters for many of these commands may be found in CCRM.

ATTACH,lfn,pfn,ID=xxxx,<parameters>.
Make a previously cataloged file available for use by this job. Many parameters, including cycle number and passwords, are available (see CCRM, 9-6). <pfn> is a 1- to 40-character permanent file name. If <pfn> is omitted, <lfn> is also <pfn>. If <lfn> is omitted, it is the first 7 characters of <pfn>. (see CATALOG, PURGE)

AUDIT. List all files cataloged by user-id xxxx (where xxxx is taken from the CHARGE card). The user should check the 'LAST ATT' (last attach) column frequently. Files which have not been used for 30 days or more are purged to tape (kept 30 days). For a sorted audit, use: BEGIN,AUDIT.

BEGIN,<parameters>.
Execute a (catalogued) procedure. See CCRM, 6-1, for a discussion of catalogued procedures (CCL).

CATALOG,lfn,pfn,ID=xxxx,<parameters>.
CATALOG,lfn,ID=xxxx,<parameters>.
Save a file after it has been written. It can then be attached in a later job. <pfn> is a 1- to 40-character permanent file name. If <pfn> is omitted, <lfn> becomes <pfn>. (see ATTACH, PURGE)

COBOL5,<parameters>.
Execute the COBOL 5 compiler. Some parameters are:
B=lfnbin - binary object program goes into file <lfnbin>
(default: B=LGO)
I=lfnin - the source program is in file <lfnin>
(default: I=INPUT)
L=lfnout - the listings will be in file <lfnout>
(default: L=OUTPUT)
(for cross references, use LO=M/R)
See CCRM, 14-3, for additional parameters.
Note: COBOL5 requires at least CM65000.

COMMENT. Add comments to the control statement record. They are printed in the dayfile.

COPYE,lfnin,lfnout.
Make an exact disk-to-disk copy of lfnin. Both <lfnin> and <lfnout> must be specified.

COPYF,lfnin,lfnout,n.
COPYR,lfnin,lfnout,n.
Copy <n> files or records (default: 1) from <lfnin> to <lfnout>. Both <lfnin> and <lfnout> must be specified.

COPYSF,lfnin,lfnout,n.
COPYSR,lfnin,lfnout,n.
Single space listing of <n> files or records (default: 1). Useful for listing files which do not have carriage control in column 1, such as source programs. (defaults for lfnin,lfnout are INPUT,OUTPUT.)

DMP,ffffff,111111.
DMP,111111.
Dump from relative octal address ffffff thru 111111. If ffffff is omitted, 0 is implied. Will stop at current FL.

EXIT. When a program ends abnormally, no more commands are executed unless there is an EXIT statement. Then control continues with the first command following the 'EXIT.' statement. For example,

```
EXIT.
DMP(65000)
```

FTN5,<parameters>.
Compile FORTRAN 77 program(s). Some parameters are:

- B=lfnbin - binary object program goes into file <lfnbin> (default: B=LGO)
- I=lfnin - the source program is on file <lfnin> (default: I=INPUT)
- L=lfnout - put listings on file <lfnout> (default: L=OUTPUT)
- OPT=n - Optimization level, may be:
  - OPT=0 - no optimization (fast compile, slow execute) (default)
  - OPT=1 - partial optimization (slower compile, faster execute)
- LO= - Cross reference list of variables and statements, etc. May be:
  - LO=A - list of variables, common blocks and attributes
  - LO=M - address map
  - LO=R - cross-reference map

  To combine, separate values with a slash (LO=A/M/R).

See CCRM, 13-2 ff, for additional parameters.

LDSET,LIB=libname.
<libname> is the lfn of an attached library of commonly used (sub)programs. When loading a user program, the loader will search the specified library for routines the program needs. LDSET applies only to the immediately following load. See 2-8: Example 4.

LGO. Load and execute object program f ⁻m compilers.

name. Load and execute local file <name> (may be an attached permanent file). For eample, ATTACH,MYPROG,ID=xxxx.
MYPROG.

PURGE,lfn,pfn,ID=xxxx,<parameters>.
PURGE,lfn,ID=xxxx,<parameters>.
Remove a file from the system. <pfn> is a 1- to 40-character permanent file name. If <pfn> is omitted, <lfn> is also <pfn>. If <lfn> is a file which has already been attached (see CCRM, 9-6), only <lfn> is required. The file remains local until returned by the user or until end-of-job.
(see ATTACH, CATALOG)

REQUEST,lfn,*PF.
File <lfn> is to be put onto permanent file space. Must be used before creating a file to be CATALOGd.

REQUEST,lfn,*Q.
File <lfn> is to be put onto queue space. Used before creating a file to be ROUTEd.

RETURN,lfn1,lfn2,...,lfnn.
Return one or more files to the system.

REWALL. Rewind all files except INPUT and OUTPUT.

REWIND,lfn1,lfn2,...,lfnn.
Position each of the listed files at its beginning.

ROUTE,lfn,<parameters>.
Route file <lfn> according to specified/implied parameters, which may include:

DC=PR	- route to printer (default for OUTPUT)
DC=PU	- route to punch (default for PUNCH/PUNCHB)
DC=SC	- scratch the file (default for most others)
DEF	- defer routing until end-of-job (batch only)
TID	- return file to job origin (default)
TID=C	- route <lfn> to Central Site
TID=tid	- route <lfn> to terminal with ID of <tid>
FC=fc	- forms code (Central Site only) for printed/punched output. For example, 1T - narrow, unlined paper (see CCRM, 5-15 for additional codes)

Note: After routing, <lfn> is gone, unless it is a permanent file.

*** Error Messages ***

If there are any errors in execution, messages will appear in the dayfile. In addition, error messages may appear in compilation listings, loader maps and program output. Fatal errors will cause a short dump to be printed on file OUTPUT.

** Mode Errors **

Mode errors are detected by the central processor and may result from any type of program.

error mode	cause
0	Attempt to execute an illegal instruction. (Probably data has overwritten part of code - this is probably a subscript problem. It may also indicate executing a stop instruction (00B).)
1	Address out of range. (Usually a subscript error. If the address is 4xxxxx, 5xxxxx, 6xxxxx, or 7xxxxx, then there is a missing subprogram. Subtract 400000 to get the address to the reference to the routine.)
2	Operand out of range -or- Infinite operand -or- Creation of an infinite (such as 'n' divided by zero) (CYBER 176)
3	Modes 1 and 2 occurred simultaneously.
4	Indefinite operand -or- Creation of an indefinite (such as zero divided by zero) (CYBER 176)
5	Modes 1 and 4 occurred simultaneously.
6	Modes 2 and 4 occurred simultaneously.
7	Modes 1, 2 and 4 occurred simultaneously.

On the CYBER 176, creation of an infinite or indefinite by any computation (including integer division by zero!) causes the program to terminate immediately. On older models of CDC computers, it simply causes an "invalid" number to be generated; the program will not terminate until the "invalid" number is actually used in a (future) computation.

Other errors are described in CCRM, Chapter 15.

*** Examples ***

1. Compile and execute a program. If the program runs, catalog the binary object program to eliminate recompilation.

```
jobname.                                        name/code
CHARGE,xxxx,accessnmbr.
REQUEST,LGO,*PF.
FTN5.      or      COBOL5.
LGO.
CATALOG,LGO,MYOBJ,ID=xxxx.
<eor>
   (source program)
<eor>
   (data cards)
<eoi>
```

2. Execute a previously cataloged binary object program.

```
jobname.                                        name/code
CHARGE,xxxx,accessnmbr.
ATTACH,MYOBJ,ID=xxxx.
MYOBJ.
<eor>
   (data cards)
<eoi>
```

3. Compile and execute. If the job runs, route the output to 200-UT terminal '142' and the dayfile to the originating terminal. If the job aborts, all of the printout goes to the originating terminal (the ROUTE statement will not be executed).

```
jobname.                                        name/code
CHARGE,xxxx,accessnmbr.
FTN5.
LGO.
ROUTE,OUTPUT,DC=PR,TID=142.
<eor>
   (FORTRAN program)
<eor>
   (data cards)
<eoi>
```

4. Compile and execute a program which uses subroutine(s) from library NSRDC5.

```
jobname.                                    name/code
CHARGE,xxxx,accessnmbr.
FTN5.     or     COBOL5.
ATTACH,NSRDC5.
LDSET,LIB=NSRDC5.          <--  make library available to the loader
LGO.
<eor>
   (source program)
<eor>
   (data cards)
<eoi>
```

5. Read and catalog a deck of cards (may be source program for later interactive use, data cards, etc.).

```
jobname.                                    name/code
CHARGE,xxxx,accessnmbr.
REQUEST,DATA,*PF.
COPYR,INPUT,DATA.
CATALOG,DATA,DATAXYZ,ID=xxxx.
<eor>
   (cards to be cataloged)
<eoi>
```

6. Illustrate control card record punched in 029 mode, next 2 records in 026 mode, last record in 029 mode.

```
jobname.                                    name/code              29
CHARGE,xxxx,accessnmbr.
   (rest of control cards in 029 mode)
<eor>                                                              26
   (cards in 026 mode)
<eor>
   (cards in 026 mode)
<eor>                                                              29
   (cards in 029 mode)
<eoi>
```

This method works only at Central Site. From 200-UT-compatible terminals, the entire deck must be in the same mode (all 029 or all 026) and the proper switch must be set or the proper emulator loaded.

7. Audit your files.

```
jobname.                                    name/code
CHARGE,xxxx,accessnmbr.
AUDIT.                    <-- list files with ID=xxxx
<eoi>
```

8. Print one copy of the Computer Center CDC Libraries (CLIB) on Xerox-8700 at Central Site.

```
jobname.                                    name/code
CHARGE,xxxx,accessnmbr.
BEGIN,MANUAL,,CLIB.
BEGIN,XEROX,,OUTPUT,xxxx,JOB=DOCPRT.
<eoi>
```

***** INTERCOM *****

Intercom is the NOS/BE interactive system. Through it, the user can execute almost all control statements. By the use of an editor, programs can be created and executed. Batch jobs may also be created and sent to the system for processing.

Intercom is more expensive than batch, but the turnaround is almost immediate. With careful planning, more work can be accomplished in less time.

The special file names (lfn's) listed on 1-2 are just file names in Intercom. If INPUT and OUTPUT are to be interactive at the terminal, they must be connected (see 3-2: CONNECT).

All user entries must be followed by carriage return. It has been omitted from most illustrations in this chapter.

Before using Intercom, user initials and access numbers must be registered with Code 1892.1. (Registration for batch use does not automatically include Intercom.)

*** Accessing Intercom *** (LOGIN)

Intercom supports teletypes, CRTs and other teletype-equivalents at 300 or 1200 baud (30 or 120 characters per second) and half-duplex. After connecting with the computer:

a) Enter carriage return within 30 seconds.
b) The computer will respond with a time and date greeting, after which enter LOGIN.
c) In response to "ENTER USER ID-" , enter your Intercom ID in the form xxxxyyyyyy .
d) In response to "**MMMMMMMMM** ENTER ACCESS NUMBER" , enter your access number in the blackened out space.
e) When the computer responds with COMMAND-, enter any valid NOS/BE or Intercom command.

See 3-7: Example 1 for a typical LOGIN sequence.

A user-defined turnkey password is available to protect against unauthorized use by others (see CCRM, 4-2). When defined, it will be requested after step d) above.

*** Leaving Intercom *** (LOGOUT)

To terminate the Intercom session, enter LOGOUT . The computer will give some statistics about the session, ending with:

```
mm/dd/yy  LOGGED OUT AT hh.mm.ss.
          <
```

You should then hang up the phone to complete the session.

*** Some Intercom Commands ***

In addition to most NOS/BE commands (see Chapter 2), several Intercom commands are available. Commands need not be ended with a terminator (period or right parenthesis) as the Intercom carriage return will supply one. Additional parameters for many of these commands may be found in CCRM, Chapter 4.

AUDIT — Intercom audit (see 2-3)
For a sorted audit, use BEGIN,AUDIT,,AI=I.

BATCH,lfn,LOCAL
Move a file from the terminal's remote output queue to a local file. It can then be PAGEd and/or ROUTEd to a printer. (see FILES)

CONNECT,lfn1,lfn2,...
Connect files to the terminal. Input and output are routed to and from the terminal when the named files are read or written. In effect, the file names are equated to the terminal. (see DISCONT)

DISCARD,lfn
DISCARD,lfn,xxxx
Same as PURGE,lfn,ID=xxxx.
RETURN,lfn.
If xxxx is omitted, it is taken from LOGIN.
If <lfn> is a local file, omit xxxx.
(see FETCH, STORE)

DISCONT,lfn1,lfn2,...
Disconnect files from the terminal. The file names are no longer equated to the terminal. (see CONNECT)

EDITOR — Program to create/modify files (described below).

FETCH,lfn
FETCH,lfn,xxxx
Same as ATTACH,lfn,ID=xxxx.
(see DISCARD, STORE)

FILES — List local files, and remote input, executing and output files. If local file is preceded by *, it is an attached PF. If local file is preceded by $, it is connected to the terminal (see BATCH, CONNECT, DISCONT).

J,jbn — <jbn> is first 1-7 characters of a jobname. Used to follow a job through the system.

J,jbn,x — Same as Q,jbn,x; <x> may also be
S - special queues (plot, paper tape, etc.)

MYQ,TOT,ALL — List number of jobs in input, execute, output, punch, special and Janus (Central Site) queues.

ATTACH,NETED.
NETED,lfn. — An alternative text editor. (see page 3-4: footnote)

PAGE — Scan a file. See CCRM, 4-23 for PAGE directives.

Q — List number of jobs in input, execute, output, punch and Janus (Central Site) queues.

Q,jbn — <jbn> is first 3-7 characters of a jobname. For all queues, list all jobs beginning with these characters. Used to follow a job through the system. When <jbn> reaches the terminal's output queue, it may be BATCHed local and PAGEd and/or ROUTEd to a printer.

Q,jbn,x — Check for <jbn> in a specified queue. <x> is one of:
- A - all queues (list of job name(s) only)
- E - execute queue
- I - input queue
- J - Janus (Central Site reader/printer/punch)
- O - output queue
- P - punch queue

Except for A, statistics are given for the job(s) listed. (see J command)

ROUTE,lfn,DC=IN
ROUTE,lfn,DC=IN,TID=xxx

Initiate a batch job from Intercom.
- lfn - file containing a complete batch job (control cards in first record)
- xxx - one of:
  - omitted - this terminal
  - C - Central Site
  - 3-character terminal ID of a 200-UT-type or another interactive terminal.

Output will go to that terminal. See 3-9: Example 7. (See BATCH, FILES)

SCREEN,size

Set maximum line length for the terminal (default: 72; maximum: 132).

SEND,xxxxyyyyyy

Send messages to another terminal. xxxxyyyyyy is the 5- to 10-character user ID (see SITUATE). End messages with a separate entry of END . For example,

```
SEND,USERSERVIC
PLEASE CALL 555-1234 TO HELP USER WITH EDITOR PROBLEMS
END
```

SITUATE — List all currently logged in users. An asterisk before indicates the user cannot receive messages.

STORE,lfn
STORE,lfn,xxxx

Same as CATALOG,lfn,ID=xxxx. (see DISCARD, FETCH)

XEQ,... — Load and/or execute a program requiring more than one loader directive (control statement). (see CCRM, 4-21)

*** Correcting and Interrupting ***

%A — Abort the current command. If the Intercom terminal is typing, the ESC key or the INTERRUPT key must be entered first to interrupt the printing. Then enter the percent key, followed by the letter A, followed by carriage return. No other character may appear in the line.

CTRL-H
BS — To delete the character just entered, use the BACKSPACE key, or hold the CTRL key while typing letter H. Repeating will remove more characters, but never more than the complete line. On some other terminals, the carriage will not move.

CTRL-X — To delete the line being entered, hold the CTRL key while typing letter X. Repeating will have no additional effect. The carriage does not move, nor is there a further prompt.

*** EDITOR ***

EDITOR (*) is a program for creating and modifying source programs and data files. Lines are numbered either by the user or EDITOR. Tabs are provided for easy spacing of information.

EDITOR directives are summarized below. Most directives and parameters may be abbreviated by the first character (see examples 4, 5, 7). Parameters in [...] are optional.

ADD [,n1 [,n2]] [,SUP] [,OVERWRITE]
Insert new lines between existing lines or add new lines at the end of the file starting with line number n1 (default: last line number + 10), incrementing by n2 (default: 10). Use SUP to suppress line number prompting. Use OVERWRITE to replace or bypass existing line numbers.

BYE — Exit EDITOR. Edit file and format information are retained. If the edit file has not been saved, an error message will be typed. You should then save the file and enter BYE again.

(*) NETED is a faster, cheaper editor supported by the Computer Center. The NETED document can be obtained by:
BEGIN,DOCGET,,OTHER,,NETED,OUTPUT,MSACCES=<password>.
The output file may be routed to print on narrow paper or the Xerox-8700 (e.g., see 2-9: Example 8).

CREATE [,n1 [,n2]] [,SUP]
Clear current contents of edit file and begin creation of a new edit file starting with line number n1 (default: 100), incrementing by n2 (default: 10). Use SUP to suppress line number prompting.

When all lines have been entered, end with = (followed by carriage return).

DELETE,ALL Delete all lines.

DELETE,n1 [,n2] [,/<string>/]
Delete line n1 or lines n1 thru n2, inclusive. If n1 is LAST and n2 is omitted, delete last line. If n2 is LAST, delete from line n1 thru last line. If specified, only those lines with matching character string will be deleted.

EDIT,lfn [,SEQUENCE]
Bring existing local file lfn into edit file and add line numbers (start with 100, increment by 10). If SEQ is omitted, lfn already contains EDITOR sequencing. If one or more lines in lfn exceeds the current line length, a message is typed by EDITOR. A user response of Y or YES will continue editing, truncating all long lines. Any other response will terminate the EDIT directive. If SEQ is omitted and lfn does not have EDITOR sequencing, an error message will be typed by EDITOR.

FORMAT,FORTRAN
FORMAT,COBOL
FORMAT,BASIC
Change formatting (default: FORMAT,FORTRAN)
Certain predefined settings are provided (for these, the tab character is ';' and the maximum line length is 510):
F,F - FORTRAN (ch=72, tabs at columns 7,10,13,16,19)
F,COB - COBOL (ch=72, tabs at 8,12,16,20,24)
F,B - Basic (ch=999, no tabs - required for entering and running Basic programs)

FORMAT,SHOW Type the current values of ch, tab character and the tab settings.

LIST [,SUP]
List current line. If SUP is specified, do not list the line number.

LIST,ALL [,SUP]
LIST,ALL,/<string>/
LIST [,n1 [,n2]] [,/<string>/]
List lines. Parameters are as described above.

n1=<text> (Re)define line n1. Until another, different directive is entered, no further prompting is given. See 3-8: Example 4.

RUN,BASIC or RUN,BASIC,NOEX
RUN,COBOL or RUN,COBOL,NOEX
RUN,FTN or RUN,FTN,NOEX
RUN,FTN5 or RUN,FTN5,NOEX
Compile Basic/COBOL/FORTRAN program (lfn OUTPUT is connected automatically). If NOEX omitted and no errors, load and execute (lfns INPUT and OUTPUT are connected automatically). Note that EDITOR does not support RUN,COBOL5.

SAVE,lfn [,NOSEQ] [,OVERWRITE]
Put edit file into local file lfn with/without sequencing. If overwrite is specified, current local file lfn is replaced (overwritten) by the current edit file (permanent files may not be overwritten). lfn is rewound before and after the SAVE. SAVE will also save subsets of lines.

/<string1>/=/<string2>/,n1,n2,(<cols>) [,UNIT]
Change all occurrences of <string1> to <string2> in line range specified. n1, n2, (<cols>) are as described above. <string1> is 1-20 characters; <string2> is 0-20 characters. String delimiters may be / or any character other than blank, comma, parenthesis, equal, letter or digit. If UNIT is specified, <string1> must have a non-alphameric character on both sides of the string to be recognized. See 3-8: Example 4.

<-- Special Text Lines **

*EOF When encountered as text during SAVE, will generate a system end-of-file.

*EOR When encountered as text during SAVE, will generate a system end-of-record. A typical use is between job control and data when creating a batch job.

*** Examples ***

1. LOGIN/LOGOUT (underlined items are to be entered by the user).
<cr> is the carriage return. All user entries must end with <cr>.

Dial the computer (227-4800 for 1200/300 baud on CYBER 176 (MFF))

```
<cr>      << establish the baud rate (1200 or 300)
NSRDC MFF INTERCOM 4.7
DATE  mm/dd/yy
TIME  hh.mm.ss.
LOGIN
ENTER USER ID-xxxxyyyyyy
xxxxxxxxxx ENTER ACCESS NUMBER
accessnmbr      (entered in blackened out space on previous line)
(Terminal ID and system bulletin will be typed, followed by:)
COMMAND-        (LOGIN is complete.  Enter commands)
   ...
LOGOUT
(several lines of session statistics are typed)
```

2. Create, execute and catalog a FORTRAN program. (System-produced printing has been omitted in this and later examples. Phrases starting with <-- are just comments and are not to be entered by the user.)

```
EDITOR
CREATE                      <-- set automatic line number generation
;PROGRAM TEST2 (INPUT=128, OUTPUT=128, TAPE5=INPUT)
C     AUTHOR AND ADDRESS
C     USES LIST-DIRECTED I/O (COMMA-SEPARATED, UNFORMATTED DATA)
;CALL CONNEC (5)
;PRINT *, 'TYPE IN A, K ,B -'
2;READ (5, *, END=10) A, K, B
;IF (A .EQ. 0.) STOP
;C = A <-- K + B
;PRINT 4, A, K, B, C
4;FORMAT (1X, F7.2, '**', I3, ' + ', F7.2, ' = ', G15.7)
;GO TO 2
10;STOP
;END
=                           <-- terminate create command
LIST,ALL                    <-- list for proofreading
SAVE,MYPROG                 <-- make local file
RUN,FTN5                    <-- compile and execute (if no errors)
BYE                         <-- leave EDITOR
STORE,MYPROG                <-- catalog for later use
```

3. Create and execute Basic program.

```
EDITOR
DELETE,ALL                <-- clear edit file
FORMAT,BASIC              <-- establish Basic editing format
100 REM COMPUTE AND PRINT
110 REM AUTHOR AND ADDRESS
120 LET P = 3.14159267
130 PRINT " ENTER X";
140 INPUT X
150 IF X<=0 THEN 200
160 LET W = SQR(P * X)
170 PRINT " ROOT IS" _
180 GO TO 130
200 END
RUN,BASIC                 <-- compile and execute
```

4. A FORTRAN program was cataloged previously. Add a PROGRAM statement, make a few modifications, catalog the new source code and execute the revised program.

```
ATTACH,OLDPROG,ID=XXXX    <-- make permanent file a local file
EDITOR
EDIT,OLDPROG,SEQ          <-- sequence the deck for editing
90=;PROGRAM TEST (INPUT=128, OUT=128)
/SIN/=/COS/,A,U           <-- text replacement, change sin to cos
/OUT/=/OUTPUT/,90         <-- correct file name in program card
D,210,220                 <-- delete lines
L,A                       <-- list for proofreading
S,NEWPROG                 <-- make local file
RUN,FTN5                  <-- compile and execute revised program
BYE                       <-- leave EDITOR
STORE,NEWPROG             <-- catalog corrected program
```

5. Compile and execute a program which requires an external file.

```
EDITOR
...                       <-- create or edit user program
RUN,F,N                   <-- compile without load or execute
BYE                       <-- leave EDITOR
ATTACH,NSRDC.             <-- get needed library ('.' optional)
XEQ,LDSET,LIB=NSRDC,LOAD=LGO      <-- load and execute
```

6. Audit your files.

```
CONNECT,OUTPUT
AUDIT
```

7. Create a batch job (needed because the execution memory requirement prohibits running on Intercom).

```
EDITOR
C,S                          <-- suppress line number generation
xxxxBIG,CM300000.                        name / code
CHARGE,xxxx,accessnmbr.
ATTACH,BIGPROG,ID=xxxx.
BIGPROG.
*EOR
    2   15    7
10.       15.
20.
346.2
=                            <-- terminate create directive
L,A                          <-- list for proofreading
S,JOB,N                      <-- save without sequencing
BYE                          <-- leave EDITOR
STORE,JOB                    <-- catalog file
ROUTE,JOB,DC=IN,TID=C        <-- put into Central Site input queue

J,xxxxB                      <-- follow progress of job, if desired
```

***** OTHER FEATURES *****

*** User Source and Object Program Libraries ***

NOS/BE has utilities for maintaining source programs and data (UPDATE) and object routines and procedures (EDITLIB) in libraries. See CCRM, Chapters 16 and 17.

*** Computer Center Libraries ***

Many libraries of programs and subprograms are maintained by the Computer Center. CCRM, Chapters 18, 19, and CLIB describe their contents and use. Many procedures (pre-defined sets of commands for performing standard tasks) are also available (see CCRM, Chapter 6, and CLIB).

*** Other Software ***

Several additional compilers, translators and other software systems are available, among them: Abaqus, APT, Checkpoint, Compass, DDL/Query Update, DMS170, GPSS, Nastran, Pascal, Simscript, Snobol, Sort/Merge, SPSS, System 2000, and text processors. See CCRM, Chapter 21.

*** Graphics ***

Graphics software packages are available for the Calcomp and Tektronix plotters and plotting terminals (see CCRM, Chapters 18, 20).

*** Alternate Output Forms ***

Output files may be printed on the Xerox-8700 laser printer (printed on 11 x 8.5 or 8.5 x 11 paper) (see CCRM, 23-7) or microfiche (see CCRM, 23-1). (This manual was printed on the Xerox-8700.)

***** USER HELP *****

Consultation is available from the User Services Branch:
Carderock: Bldg 17, Room 100 (202) 227-1907
Annapolis: Bldg 100, Room 1-T (301) 267-3343

*** Computer Status Phone ***

For a recorded message on the status of the CDC computers, call (202) 227-3043.

*** Trouble Form ***

A Trouble Form is used for refund requests, problems, suggestions, gripes, etc. Gripes or other comments may be entered directly into the computer from Intercom using BEGIN,GRIPE. There is prompting for all information.

*** Training ***

Several classes (FORTRAN, COBOL, NOS/BE, etc.) are offered periodically by the User Services Branch. Call for current information.

The statement

```
BEGIN,DOCGET,,CLASS,,A,OUTPUT,MSACCES=<your password>.
```

may be used to obtain the current list of possible classes including dates for those which are scheduled.

Initial Distribution

Copies:

12 Director
Defense Technical Information Center (DTIC)
Cameron Station
Alexandria, Virginia 23314

Center Distribution

Copies:

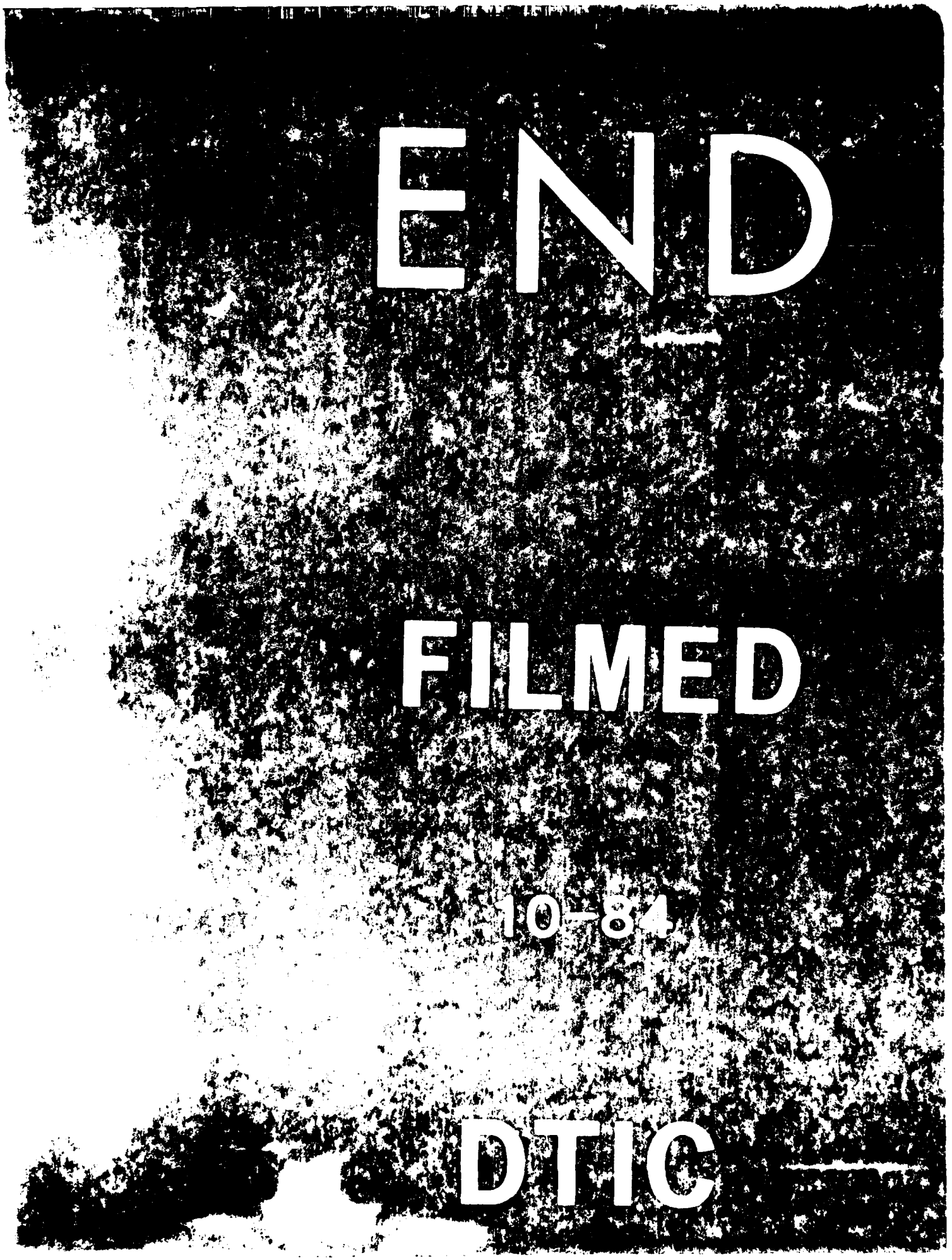
1	18/1809	Gleissner, G. H.
1	1804	Avrunin, L.
1	1805	Cuthill, E. H.
2	1808	Wildy, D.
1	182	Camara, A. W.
1	184	Schot, J. W.
1	185	Corin, T.
1	187	Zubkoff, M. J.
1	189	Gray, G. R.
1	189.2	Hayden, H. P.
1	189.3	Morris, J.
15	1892.1	Strickland, J. D.
5	1892.2	Sommer, D. V.
1	1892.3	Minor, L. R.
1	1894	Seals, W.
1	1896	Glover, A.
1	1896.2	Dennis, L.
1	522	TIC (C)
1	522.2	TIC (A)
1	93	Patent Counsel

DTNSRDC ISSUES THREE TYPES OF REPORTS

1. DTNSRDC REPORTS, A FORMAL SERIES, CONTAIN INFORMATION OF PERMANENT TECHNICAL VALUE. THEY CARRY A CONSECUTIVE NUMERICAL IDENTIFICATION REGARDLESS OF THEIR CLASSIFICATION OR THE ORIGINATING DEPARTMENT.

2. DEPARTMENTAL REPORTS, A SEMIFORMAL SERIES, CONTAIN INFORMATION OF A PRELIMINARY, TEMPORARY, OR PROPRIETARY NATURE OR OF LIMITED INTEREST OR SIGNIFICANCE. THEY CARRY A DEPARTMENTAL ALPHANUMERICAL IDENTIFICATION.

3. TECHNICAL MEMORANDA, AN INFORMAL SERIES, CONTAIN TECHNICAL DOCUMENTATION OF LIMITED USE AND INTEREST. THEY ARE PRIMARILY WORKING PAPERS INTENDED FOR INTERNAL USE. THEY CARRY AN IDENTIFYING NUMBER WHICH INDICATES THEIR TYPE AND THE NUMERICAL CODE OF THE ORIGINATING DEPARTMENT. ANY DISTRIBUTION OUTSIDE DTNSRDC MUST BE APPROVED BY THE HEAD OF THE ORIGINATING DEPARTMENT ON A CASE-BY-CASE BASIS.


END
FILMED
10-84
DTIC